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This article outlines the development and initial validation of the Controlling Coach Behaviors Scale (CCBS), a multidimensional self-report measure designed to assess sports coaches' controlling interpersonal style from the perspective of self-determination theory (Ryan & Deci, 2002). Study 1 generated a pool of items, based on past literature and feedback from coaches, athletes, and academic experts. The factorial structure of the questionnaire was tested using exploratory and confirmatory factor analyses across Studies 2 and 3. The final CCBS model in Study 3 comprised 4 factors (controlling use of rewards, conditional regard, intimidation, and excessive personal control) and was cross-validated using a third independent sample in Study 4. The scale demonstrated good content and factorial validity, as well as internal consistency and invariance across gender and sport type. Suggestions for its use in research pertaining to the darker side of coaching and sport participation are discussed.

Keywords: self-determination theory, rewards, negative conditional regard, intimidation, personal control, scale development

In the sport context, the behavior and interpersonal style of the coach can play a major role in shaping not only athletes' performance, but also the psychological experiences that athletes derive from their sport participation (Vallerand & Losier, 1999). Research conducted in the coaching context has used instruments such as the Leadership for Sport Scale (LSS; Chelladurai & Saleh, 1980), the Coach Behaviors Assessment System (CBAS; Smith, Smoll, & Hunt, 1977), and the Coaching Behavior Scale for Sport (CBS-S; Côté, Yardley, Hay, Sedgwick, & Baker, 1999), to assess the impact of a variety of coaching behaviors (e.g., autocratic/democratic decision-making styles, personal rapport, social support, and feedback) upon outcomes such as motivation, enjoyment, and satisfaction (for a review, see Chelladurai & Reimer, 1998). This work has shown that the coaching behaviors used

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in youth sport have a significant influence upon the psychological experiences of young athletes (Smoll & Smith, 2002). However, Amorose and Horn (2000) have suggested that there may be other important coaching behaviors that also need to be examined. For example, previous research has shown that coaches' tendency to be autonomy supportive or controlling can influence athlete motivation (see Mageau & Vallerand, 2003). Although there has been some research looking at autonomy-supportive coach behaviors, the empirical evidence concerning coaches' use of controlling behaviors is scarce. Therefore, the purpose of this article is to present a scale that assesses sports coaches' controlling interpersonal style from the perspective of self-determination theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2002).

SDT and Interpersonal Styles

Self-determination theory suggests that a coach's behavior can be viewed in terms of two interpersonal styles: autonomy supportive and controlling. Research in the sport and physical education literature, as well as in other life contexts, has primarily focused on (coaches') autonomy-supportive behaviors (see Mageau & Vallerand, 2003). An autonomy-supportive style actively supports self-initiated strivings and creates conditions for athletes to experience a sense of volition, choice, and self-endorsement.

Research guided by SDT in the sport and physical education literature has demonstrated that autonomy-supportive coach behaviors (e.g., offering a rationale and acknowledging feelings) are related to more self-determined forms of motivation in athletes (Pelletier, Fortier, Vallerand, & Brière, 2001). To be self-determined means to act with a full sense of volition and choice (Ryan & Deci, 2002). Behaviors are fully endorsed by the athlete and engaged in because they are interesting (i.e., intrinsic motivation) or personally important (i.e., identified regulation). Research has consistently shown that athletes whose motivation is more self-determined tend to report positive outcomes, such as enhanced persistence, effort, performance, vitality, self-esteem, and well-being (Ryan & Deci, 2002).

Specifically, SDT proposes that an autonomy-supportive interpersonal style will enhance athletes' self-determined motivation because it contributes to the satisfaction of their psychological needs. The theory (Deci & Ryan, 2000) identifies three innate psychological needs: autonomy (the degree to which individuals feel volitional and responsible for the initiation of their behavior), competence (the degree to which individuals feel able to achieve their goals and desired outcomes), and relatedness (the degree to which individuals feel connected to others in their social context). A number of studies conducted in the sport domain have supported the mediational effect of need satisfaction in the relationship between perceived autonomy-supportive coaching behaviors and athletes' self-determined motivation (e.g., Amorose & Anderson-Butcher, 2007).

In contrast, coaches exhibiting a controlling interpersonal style behave in a coercive, pressuring, and authoritarian way to impose a specific and preconceived way of thinking and behaving upon their athletes. As a consequence, the external pressures applied by the coaches are perceived by their athletes to be the origin of their own behavior. Therefore, controlling coaching behaviors can induce a change in the athletes' perceived locus of causality from internal to external. The resultant loss of control undermines athletes' psychological needs and sense of

self-determination, and contributes to controlled motivation (Blanchard, Amiot, Perreault, Vallerand, & Provencher, 2009; Deci & Ryan, 1985). The latter reflects motivation based upon coercive demands and reward contingencies (i.e., external regulation), or one's sense of guilt or obligation (i.e., introjected regulation). Such pressures force athletes into engaging in requested behaviors that are carried out but reflect a lack of personal endorsement.

Surprisingly, there has been very little SDT-based research on the use of controlling motivational strategies by coaches. A notable exception is a study by Pelletier et al. (2001) that assessed swimmers' perceptions of their coaches' autonomy-supportive as well as controlling interpersonal behaviors. To tap coaches' coercive (controlling) behaviors, the researchers incorporated a four-item scale adapted from the client motivation for therapy scale (Pelletier, Tuson, & Haddad, 1997), which included items such as, "My coach pressures me to do what he/she wants." In line with SDT, controlling coach behaviors predicted non-self-determined forms of regulation, particularly external regulation. Pelletier et al. (2001) also revealed a significant, but relatively small, negative association between the latent factors of swimmers' perceptions of their coach's provision of autonomy support and control ($r = –0.36$), a finding that was presented as evidence that controlling behaviors are not the exact opposite of autonomy-supportive behaviors. A similar argument has been made in the parental literature (see Silk, Morris, Kanaya, & Steinberg, 2003), as well as in work investigating the interpersonal behaviors of physical education teachers (Tessier, Sarrazin, & Ntoumanis, 2008).

It follows that coaches may engage in both controlling and autonomy-supportive behaviors simultaneously and to different extents (for example, a coach may use conditional regard as a discipline strategy but may also provide a clear rationale for requested behaviors). This also means that the absence of autonomy-supportive behaviors (i.e., as indicated by low scores on an existing measure of autonomy support) cannot automatically be equated with the presence of controlling coach behaviors. The absence of autonomy support might, for instance, simply be indicative of a more neutral rather than directly controlling style. Such observations strengthen the need to understand exactly how controlling interpersonal behaviors are implicated in athletes' motivation and well-being and to identify those strategies that negatively impact upon the psychological experiences of young athletes.

SDT and Controlling Motivational Strategies

The use of controlling motivational strategies has been more extensively discussed in the parental and educational literatures. Therefore to identify controlling strategies that might also be employed by coaches in sports contexts, Bartholomew, Ntoumanis, and Thøgersen-Ntoumani (2009) reviewed the research conducted in each of these domains, as well as the relevant sport literature. The review yielded a large number of controlling behaviors. For the purposes of scale development, we chose the behaviors that were more distinct, likely to be exhibited in a variety of sport situations, and easily perceived by young athletes. Further, we aimed to present a measure that was not overly long and met stringent standards of adequate factorial structure.

Among the most prominent controlling strategies is the *controlling use of rewards*. The fact that extrinsic rewards can be used to control behavior has long

been established in the psychological literature (Skinner, 1953). There is now also a considerable amount of evidence from a SDT perspective, primarily from educational settings, to support the undermining effect of rewards on intrinsic motivation. Deci, Koestner, and Ryan (1999) have argued that tangible rewards that are provided as an incentive for engaging with and completing a task (task-contingent rewards), or for reaching certain performance standards (performance-contingent rewards), can damage intrinsic motivation in the context of an interesting task, particularly when the rewards are expected. The undermining effect of rewards on intrinsic motivation has also been supported in the sport context (Amorose & Horn, 2000; Ryan, 1980; Vansteenkiste & Deci, 2003). In addition, the use of verbal rewards such as praise can also be controlling (Deci et al., 1999). This is because general praise that is noncontingent on performance (e.g., "Well done, you have done exactly what I told you") can be perceived as insincere and a contrived attempt to reinforce particular behaviors (for a review, see Henderlong & Lepper, 2002). Therefore, we suggest that controlling coaches may use extrinsic rewards and praise to induce engagement or persistence in certain behaviors and secure athlete compliance.

The vulnerability of the athlete to manipulative and abusive training methods increases when the value of the performance replaces the value of the individual. Pressurized sporting environments, in which the self-worth and reputation of the coach may equate to the performance of his or her athletes, can give rise to maladaptive coaching strategies. These include the use of shame, blame, and fear tactics, which undermine the coach–athlete bond (Conroy & Coatsworth, 2007; Ryan, 1996). The use of conditional regard and intimidation are two controlling motivational strategies, identified in the parental literature, that employ such maladaptive tactics (see Barber, 1996).

Negative conditional regard refers to the withholding of love, attention, and affection by those in a position of authority when desired attributes or behaviors are not displayed by their subordinates (Assor, Roth, & Deci, 2004). In the parental literature, conditional regard has been identified as a socialization technique shown to promote introjected regulation (Assor et al., 2004). Although children do enact requested behaviors, they do so to avoid feelings of guilt or shame. Qualitative research suggests that some coaches also use negative conditional regard, displaying complete indifference toward athletes after they have lost a competition, in an attempt to increase future effort and exhort higher performance (D'Arripe-Longueville, Fournier, & Dubois, 1998; Fraser-Thomas & Côté, 2009). Mageau and Vallerand (2003) proposed that because conditional regard makes a coach's attention and acceptance highly contingent upon his or her athletes emitting appropriate thoughts and behaviors, athletes may come to see their own thoughts and feelings as a threat to the emotional bond they share with their coach. Thus, athletes may relinquish their autonomy to maintain a satisfactory relationship with their coach.

Behaviors that are used to *intimidate* involve the display of power-assertive strategies designed to humiliate and belittle, such as verbal abuse and threats, yelling, and the threat or use of physical punishment. All of these strategies can be used to control behavior as they foster external regulation by creating pressure from outside to behave in certain ways to avoid external punishment (Ryan, 1982). Research carried out in the sport context suggests that coaches can engage in intimi-

dating behaviors that have a negative impact upon the psychological experiences of athletes (D'Arripe-Longueville et al., 1998). For example, athletes who report feeling intimidated and fearful of their coach also report higher levels of cognitive and somatic sport anxiety (Baker, Côté, & Hawes, 2000).

In addition, Barber (2001) proposed that the use of *excessive personal control* by parents can compromise children's perceptions of autonomy and undermine their need for relatedness (Allen, Hauser, Eickholt, Bell, & O'Conner, 1994; Kerr & Stattin, 2000). Excessive personal control involves the use of intrusive monitoring (e.g., the extent to which parents know/control what their child is doing during his/her free time) and the imposition of strict limits (Barber, 1996; Kerr & Stattin, 2000). Evidence suggests that coaches can also exert excessive personal control and engage in over-intrusive behaviors such as attempting to interfere in aspects of the athletes' lives that are not directly associated with their sport participation, for example, by banning athletes from playing other sports or from staying out late (Fraser-Thomas & Côté, 2009). As such, athletes may experience extreme pressure from coaches to prioritize their sport involvement over other important aspects of their life, such as spending time with family and friends. In extreme cases, an athlete's whole life is expected to revolve entirely around his or her sport participation (Scanlan, Stein, & Ravizza, 1991; Ryan, 1996).

Finally, the parental literature also indicates that parent–child interactions that *judge or devalue* interfere with the development of individuality. When parents consistently dismiss their children's own perspective and impose values and ideals upon them, the children subsequently have difficulty recognizing their own uniqueness or self-worth and become unwilling to trust their own ideas for fear of damaging their relationship with their caregiver (Barber, 1996). Subsequently, children may comply with the advocated values and behaviors but this is primarily to reduce the possibility of value-related conflict, as well as feelings of rejection, anxiety, or guilt associated with such conflict (Tangney & Dearing, 2002). Thus behavior is controlled (Ryan & Deci, 2002). It is likely that the same situation will occur when coaches dismiss their athletes' perspectives and judge and devalue them by treating them not as individuals with their own thoughts and feelings, but as objects that should be controlled to obtain certain outcomes (i.e., winning). In such circumstances, athletes may relinquish their autonomy and could come to depend upon their coach in a way that thwarts their own psychological needs.

Although existing questionnaires may contain items or subscales that have the potential to tap aspects of maladaptive coaching strategies (e.g., autocratic coach behaviors, such as not compromising on a point [LSS], punishment-oriented feedback [CBAS], and the use of fear [CBS-S]), they are scattered and do not provide a comprehensive picture of a controlling interpersonal style. As far as we are aware, there has been no systematic psychometric attempt to develop and validate a measure of the controlling motivational strategies employed by coaches in the sport context (or other persons situated in a position of authority in other life contexts). To address this significant gap in the literature, the present paper outlines the development of a SDT-based multidimensional questionnaire designed to assess coaches' controlling interpersonal style by tapping the extent to which young athletes perceive their coach to engage in a variety of controlling behaviors during coach–athlete interactions. We hope that such a scale will facilitate research into the darker side of coaching and sports participation.

Present Research

A series of four studies were carried out in a youth sport context to develop and confirm the validity and reliability of the Controlling Coach Behaviors Scale (CCBS). The research focused on youth sport because approximately 33% of young athletes discontinue their involvement with competitive sport each year (Petlichkoff, 1996), some due to pressures imposed by an over-demanding (and/or disliked) coach (Butcher, Lindner, & Johns, 2002). Gould (2007) has also suggested that these negative factors have less impact upon the participation of older athletes. It is younger athletes who are more likely to report a range of negative psychological outcomes (e.g., damaged self-esteem, anxiety, and depression) as a result of the often extreme mental and physical demands placed upon them in the sport context (Brustad, 1988; Ommundsen & Vaglum, 1991). This makes youth sport an obvious setting in which to examine controlling motivational strategies.

Study 1

Study 1 aimed (a) to gather relevant views on coaching environments and gauge how applicable the controlling strategies identified in the literature review were to the sport context, and (b) to create and provide evidence for the content validity of a pool of items designed to tap sport coaches' controlling interpersonal behaviors.

Method

Participants

The sample (N = 23) comprised 6 British coaches and 17 British athletes. The coaches were drawn from three sports, athletics (n = 1), swimming (n = 3), and squash (n = 2). The athletes were 7 males and 10 females aged between 12 and 17 years old (M = 14.41; SD = 1.42). These athletes represented three sports, athletics (n = 5), swimming (n = 7), and dancing (n = 5), and were competing at regional (n = 6) or national (n = 11) level at the time of the study. Their competitive experience ranged from 3 to 10 years (M = 6.75; SD = 2.11), and they had spent between 6 months and 10 years (M = 3.41 years; SD = 3.55) working with their current coach. A panel of nine academic experts in SDT-based research (who published in the sport, parental, and educational literatures) were also consulted to review the content validity of the items from a theoretical perspective.

Procedure

Ethical approval was obtained from the investigators' university ethics committee for each of the four studies reported in this article. Study 1 consisted of six coach interviews and three athlete focus groups. After the interviews and focus groups, an online survey was also set up to obtain additional feedback (on the resultant items) from academic experts.

Each coach interview lasted approximately 60 min. A semistructured interview schedule was used to facilitate general discussion relating to the positive and negative motivational strategies the coaches used themselves while coaching, as well as

those they had seen or heard of being used by other coaches. The purpose of these interviews was to identify the most frequently used controlling coaching strategies. The athlete focus groups were all approximately 90 min in length. Athletes were provided with lay definitions of various controlling motivational strategies and asked, by considering their own sporting experiences, to comment upon the relevance of the identified behaviors during guided group discussion. Afterward, an initial pool of 53 items (based upon a thorough review of the controlling motivational strategies identified in the literature, previous quantitative measures, and the personal experiences of the principal investigator) was presented to the athletes and, using a dichotomous scale (*applicable* versus *inapplicable*), they were instructed to assess the relevance of each item to the sport context. For the applicable items, athletes were also asked to rate their clarity using a 7-point scale (1 = *not at all clear* to 7 = *extremely clear*). The athletes' anonymous responses were then discussed at a group level and athletes were encouraged to suggest additional items or alternative wordings for items that were perceived to be problematic (i.e., items that were rated below 5).

Subsequently an online questionnaire was set up and academic experts worldwide were recruited, via an invitational e-mail, to review the pool of items established following the interviews and focus groups. The experts were provided with definitions of the controlling strategies and, using a 5-point scale (1 = *poor match* to 5 = *excellent match*), were asked to indicate the extent to which they perceived each of the items to tap the controlling motivational strategies we had assigned to them. They were also asked to make suggestions for alternative items or additional strategies.

Results and Discussion

The coaches and athletes interviewed in this study believed that all five of the controlling strategies we identified (i.e., the controlling use of rewards, negative conditional regard, intimidation, excessive personal control, and judging and devaluing) occurred frequently in the sport context. Although the interview process did not result in the identification of any new controlling motivational strategies, four new items were added to reflect additional interpersonal behaviors suggested by the coaches and athletes. The athletes also evaluated the relevance and clarity of each item. As a result, 16 items were deemed inapplicable to the sport context and were thus eliminated, and 11 items were rewritten to improve their clarity and broaden their applicability across sports. The resultant pool of 41 items was then examined by the academic experts. The ratings provided by the experts were used to calculate the Content Validity Index (CVI; Lynn, 1986) for each item and inform final decisions about whether to retain, eliminate, or revise the items. The CVI was calculated by dividing the number of experts who gave a rating of 4, 5, or 6 (i.e., rated the item as a good match, a very good match, or an excellent match to the identified controlling motivational strategy) by 9, the number of experts on the panel. Lynn (1986) suggested that when expert panels consist of six or more reviewers, CVIs in the vicinity of .80 are acceptable (see also Polit, Beck, & Owen, 2007). Twelve items displayed CVIs of .67 (6/9) or below and were thus deemed to be invalid. Of these items, eight were eliminated and four were revised in line with the suggestions made by the academic experts. All of the remaining

items exhibited CVIs ranging from .78 (7/9) to 1.00 (9/9) and were thus retained. However, the wording of nine items was slightly modified to ensure that the items clearly tapped overly controlling coach behaviors, as opposed to behaviors that could be elicited by coaches characterized as "caring" (a concern raised by one of the expert reviewers). These modifications produced a reduced pool of 33 items that tapped a variety of sports coaches' controlling interpersonal behaviors from a theoretical perspective, and were deemed to be clear and applicable to the sport context by athletes and coaches.

Study 2

The next step in the measurement development process was to administer a questionnaire containing the 33 items to a large sample in order to test the factorial composition of the items generated in Study 1 via exploratory factor analysis (EFA). The use of EFA is advocated during the early stages of scale development to avoid misspecification of the number of factors and to maximize the convergent and discriminant validity of the items constituting each factor (Gerbing & Hamilton, 1996; Hurley el al., 1997; Kelloway, 1995).

Method

Participants

The sample ($N = 264$) comprised 143 males and 115 females aged between 12 and 17 years old ($M = 14.32$; $SD = 1.68$); the remaining athletes did not report their gender. The athletes were involved in both individual sports ($n = 220$), such as athletics, swimming, rowing, and squash, and team sports ($n = 44$), such as football and cricket. They were competing at club ($n = 55$), county ($n = 53$), regional ($n = 57$), national ($n = 79$), or international ($n = 20$) level at the time of the study. The athletes' competitive experience ranged from 1 to 11 years ($M = 4.92$; $SD = 2.60$) and they had spent between 1 month and 8 years ($M = 2.13$ years; $SD = 1.66$) working with their current coach.

Measure and Procedure

At the beginning of the questionnaire, written instructions requested that the athletes should consider their general experiences with their current coach. They were told that each coach has a different coaching style and that no one style is necessarily better than another. The stem used in the questionnaire was, "please indicate how much you agree or disagree with each statement," and the 33 items generated in Study 1 were assigned a 7-point scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*.

Athletes were recruited via club coaches and sports event organizers. The purpose and nature of the study was explained, and athlete, coach, and parental consent were obtained. The primary researcher personally supervised the questionnaire completion (which took place either after a normal training session or before an event/competition) for 65.6% of the athletes involved in this study. Standardized instructions were given by the same researcher and athletes were reassured that

their responses would be confidential and anonymous (all coaches were asked to leave the area while athletes completed the questionnaire). Such confidentiality assurances have been shown to improve the response rate for sensitive data (Ransdell, 1996). For athletes who could only be reached by mail, the researcher sent enveloped questionnaire packs, including written instructions and consent forms, to a contact at the club (34.4% of athletes were reached this way). Athletes were then allowed to take the questionnaire away with them and return it to the contact person (in a sealed envelope), who mailed the questionnaires back to the researcher.

Results and Discussion

An EFA was conducted on the 33 items to identify underlying dimensions of controlling coach behavior. Principal axis factor analyses were carried out with a direct oblimin rotation. An oblique rotation was used since it was hypothesized that the underlying dimensions of a controlling interpersonal style would be interrelated. Factor extraction was based on an eigenvalue value of > 1.0 and a confirmatory inspection of the scree plot. In terms of interpreting the extracted factors, item loadings of .30 and above were considered satisfactory (Kline, 1994). All items with primary factor loadings of < .30 and all items with high cross-loadings (i.e., secondary loadings > .30) were deleted.

Employing the aforementioned criteria in examining the pattern matrix, 17 items were removed following a sequence of factor analyses. The final EFA solution contained 16 items that loaded on to five factors and accounted for 43.68% of the item variance (see Table 1 for item means, standard deviations, factor loadings, factor correlations, and internal consistency estimates). Analysis of item content suggested that the extracted items could be represented by five dimensions. Factor 1, the *Controlling Use of Rewards*, consisted of three items that reflected coaches' use of extrinsic rewards and praise to induce athlete engagement or persistence in certain behaviors. Factor 2, the use of *Negative Conditional Regard*, consisted of three items that reflected cases in which coaches withhold attention and support from athletes who do not display desired attributes and behaviors. Factor 3 was labeled *Intimidation* and consisted of three items that reflected the strategies coaches may use to intimidate their athletes into emitting requested behaviors. Factor 4, the use of *Excessive Personal Control*, consisted of three items that reflected coaches' over-intrusive behaviors. Finally, Factor 5, *Judging and Devaluing*, consisted of four items reflecting the behaviors coaches may engage in that actively undermine athletes' feelings of self-worth. The factor correlations were small to moderate and ranged from $r = .14$ to $r = .46$ (Table 1).

Once we had determined the underlying dimensions of controlling coach behavior, we carried out item analysis to assess the homogeneity of the items representing each factor (DeVellis, 1991). To assess the internal reliability of each factor, we used the following criteria: (a) an interitem correlation between $r = .20$ and $r = .70$, and (b) a minimum corrected item-total correlation of $r = .30$ (Kidder & Judd, 1986). Item analysis identified one of the reward items as particularly problematic ("My coach tries to motivate me by promising to reward me if I do well"). Due to documented shortcomings (see Sijtsma, 2009; Huysamen, 2006) associated with Cronbach's alpha (Cronbach, 1951), Raykov's composite reliability coefficient (rho [ρ]; Raykov, 1997) was employed to assess the internal reliability of each factor.

Table 1 Item Means, Standard Deviations, Factor Loadings, and Skewness and Kurtosis Values Following Exploratory Factor Analyses (Study 2)

CCBS Subscale and Item	*M*	*SD*	F1	F2	F3	F4	F5	Skewness	Kurtosis
Controlling Use of Rewards									
My coach tries to motivate me by promising to reward me if I do well	3.32	1.76	*.34*	.03	.01	.10	.01	0.44	–0.64
The only reason my coach rewards/praises me is to make me train harder	3.28	1.67	*.38*	.14	.08	.10	.16	0.33	–0.71
My coach only uses rewards/praise so that I stay focused on tasks during training	3.17	1.48	*.72*	.04	.03	.24	.04	0.39	–0.36
Negative Conditional Regard									
My coach is less friendly with me if I don't make the effort to see things his/her way	3.74	1.70	.06	*.64*	.07	.08	.11	1.00	–0.77
My coach is less supportive of me when I am not training and competing well	3.30	1.83	.07	*.44*	.00	.16	.25	0.40	–0.86
My coach pays me less attention if I have displeased him/her	3.61	1.73	.09	*.60*	.07	.08	.21	0.18	–0.81
Intimidation									
My coach shouts at me in front of others to make me do certain things	2.50	1.84	.07	.09	*.56*	.03	.05	1.03	–0.11
My coach uses the threat of punishment to keep me in line during training	2.43	1.76	.07	.01	*.79*	.11	.03	1.08	0.06
My coach intimidates me into doing the things that he/she wants me to do	2.35	1.63	.08	.08	*.52*	.25	.07	1.07	0.25
Excessive Personal Control									
My coach expects me to put my sport before other important parts of my life	3.79	1.90	.03	.23	.05	*.39*	.08	0.07	–1.07
My coach tries to control what I do during my free time	2.19	1.53	.09	.09	.02	*.60*	.06	1.22	0.58
My coach tries to interfere in aspects of my life outside of my sport	2.27	1.56	.04	.04	.15	*.65*	.05	1.14	0.47
Judging and Devaluing									
My coach evaluates me negatively if I perform badly	3.41	1.77	.03	.11	.06	.07	*.64*	0.29	–0.91
My coach is very judgmental if I am not competing well	3.26	1.73	.12	.07	.07	.03	*.68*	0.46	–0.53
My coach is overly critical of me when he/she provides me with feedback	2.95	1.51	.12	.12	.04	.10	*.60*	0.61	–0.09
My coach undervalues my contribution to the team	2.50	1.55	.16	.05	.13	.07	*.39*	1.05	0.58

Factor Correlations and Internal Consistency	1	2	3	4	5
1. Controlling Use of Rewards	.53				
2. Negative Conditional Regard	.14	.70			
3. Intimidation	.31	.36	.69		
4. Excessive Personal Control	.16	.31	.28	.64	
5. Judging and Devaluing	.25	.46	.44	.46	.74

Note. F1 = Controlling Use of Rewards, F2 = Negative Conditional Regard, F3 = Intimidation, F4 = Excessive Personal Control, F5 = Judging and Devaluing. Numbers in italics indicate primary loadings. Composite reliability coefficients are presented on the diagonal of the factor correlation matrix.

Despite the remaining items satisfying criteria (a) and (b), the controlling use of rewards and excessive personal control factors displayed low internal reliability (ρ = .53 and .64, respectively). The composite reliability coefficient for the intimidation factor was also relatively low (ρ = .69).

Despite the low estimates of internal reliability, the extracted factors appeared to represent salient controlling motivational strategies identified in the literature and considered to be important by athletes, coaches, and SDT experts in Study 1. Conceptually, therefore, the five factors appeared sound and thus we believed that it would be premature to delete any of the extracted factors at such an early stage of psychometric testing. Therefore, to increase the internal reliability estimates, the decision was made to rephrase some of the existing items and write additional items so that the factor structure of the questionnaire could be tested again in Study 3, using an independent sample. We included three additional items that we hoped would better tap the controlling use of rewards by coaches and added one additional item to each of the other three-item factors. Thus, we ended up with a 22-item questionnaire consisting of 16 existing items and 6 new items.

Study 3

The purpose of Study 3 was to use confirmatory factor analysis (CFA) to cross-validate the findings of the EFA and further refine the structure of the scale if necessary. Study 3 also examined whether the resultant CCBS scores were invariant across gender and sport type (team and individual) and explored the relationship between controlling and autonomy-supportive coach behaviors.

Method

Participants

The sample (N = 303) comprised 169 males and 122 females aged between 12 and 17 years old (M = 14.79; SD = 1.60); 12 athletes did not report their gender. The athletes represented individual (n = 177) and teams sports (n = 126) similar to those sampled in Study 2. They were competing at club (n = 72), county (n = 50), regional (n = 31), national (n = 102), or international (n = 34) level at the time of the study. The remaining athletes did not report their competition level. Competitive experience ranged from 1 to 13 years (M = 5.23; SD = 2.91), and the athletes had spent between 1 month and 11 years (M = 2.27 years; SD = 1.83) working with their current coach.

Measures and Procedure

The CCBS, as described in Study 2, was administered. The scale consisted of 22 items representing the five factors Controlling Use of Rewards, Negative Conditional Regard, Intimidation, Excessive Personal Control, and Judging and Devaluing. Athletes' perceptions of their coach's autonomy-supportive behaviors were also measured in the current study using six items taken from the Health-Care Climate Questionnaire (HCCQ; Williams, Grow, Freeman, Ryan, & Deci, 1996)

and modified for their use in sport (e.g., "I feel that my coach provides me with choices and options"). The modified scale has demonstrated good psychometric properties in samples of adolescent athletes (e.g., Reinboth, Duda, & Ntoumanis, 2004). Participant recruitment and data collection procedures remained the same as previously outlined in Study 2. Of the sampled athletes, 53.1% completed the questionnaire supervised and 46.9% were reached by mail.

Data Analysis

To cross-validate the findings of the EFA, the 22 items were analyzed via CFA using EQS 6.1 (Bentler & Wu, 2002).[1] Confirmatory factor analysis is considered a robust test of factorial validity (Kline, 1994). No cross-loadings of items were allowed, all latent factors were intercorrelated, and one item from each factor was fixed to 1.0 for purposes of identification and latent variable scaling. The adequacy of the model to the data was evaluated using multiple fit indices, such as the chi-square statistic, the comparative fit index (CFI; Bentler, 1990), the Bentler–Bonett non-normed fit index (NNFI; Bentler & Bonett, 1980), the standardized root mean residual (SRMR; Hu & Bentler, 1998), and the root mean square error of approximation (RMSEA; Steiger, 1990). Although values indicative of acceptable model fit remain controversial (Markland, 2007; Marsh, Hau, & Wen, 2004), it is typically accepted that an excellent fit between the hypothesized model and the data is indicated by values of around .95 and above for the NNFI and CFI, and for the SRMR and RMSEA, values of .08 and .06 or less, respectively (Hu & Bentler, 1999). In addition, standardized factor loadings, standardized residuals, and modification indices were analyzed to screen for model misspecification. Items with standardized factor loadings below .40 or a large standardized residual (>|2.00|) were considered for deletion. Discriminant validity was also investigated through inspection of the factor correlations, and the tenability of a hierarchical model and an alternative one-factor model were tested. Further data analysis also calculated scale descriptives and internal reliability estimates. The resultant CCBS scores were then tested to ascertain whether they would be invariant across gender and sport type (team/individual). Finally, the correlations between athletes' perceptions of their coach's controlling and autonomy-supportive behaviors were obtained.

Results and Discussion

Distribution of the CCBS Items

The univariate skewness values of the CCBS items ranged from .49 to 1.51 and the univariate kurtosis values ranged from –.95 to 1.51, suggesting that all items were within acceptable ranges (e.g., Chou & Bentler, 1995; Kline, 1998; West, Finch, & Curran, 1995). However, examination of Mardia's normalized coefficients of multivariate kurtosis indicated that the data departed from multivariate normality (e.g., for the five-factor model, the coefficient was 36.88). Subsequently, and in line with the recommendations of Chou, Bentler, and Satorra (1991), all CFAs were conducted using the robust maximum likelihood (ML) estimation procedure. A robust χ^2 statistic called the Satorra–Bentler scaled statistic (S-Bχ^2; Satorra & Bentler, 1994) and robust parameter standard errors (Bentler & Dijkstra, 1985) are

produced using this method to correct for non-normality in large samples (200–500 cases; West, Finch, & Curran, 1995).

Confirmatory Factor Analysis

Results of the CFA suggested a relatively good fit to the data, but indicated room for improvement: S-Bχ^2 (179) = 330.65, $p < .001$, RCFI = .93, RNNFI = .92, SRMR = .06, RRMSEA = .05. Large modification indices suggested that the residuals associated with two items (one tapping the controlling use of rewards and another tapping excessive personal control) correlated with those of other items. In addition, a second reward item exhibited a low standardized factor loading. Excluding these three items improved the fit of the model to the data: S-Bχ^2 (142) = 229.12, $p < .001$, RCFI = .96, RNNFI = .95, SRMR = .05, RRMSEA = .05. However, an inspection of the factor correlations revealed that the judging and devaluing factor correlated highly with three of the other four factors (conditional regard $r = .88$, intimidation $r = .82$, excessive personal control $r = .72$).

As a result of the high correlations, the decision was made to remove the judging and devaluing factor and subsequently test a four-factor model consisting of Controlling Use of Rewards, Negative Conditional Regard, Intimidation, and Excessive Personal Control. The final 15-item four-factor model also produced an excellent fit to the data: S-Bχ^2 (84) = 144.38, $p < .001$, RCFI = .96, RNNFI = .95, SRMR = .05, RRMSEA = .05. The model included three 4-item factors (Controlling Use of Rewards, Negative Conditional Regard, and Intimidation) and one 3-item factor (Excessive Personal Control). All factor correlations remained significant but below .70, and all four factors demonstrated adequate internal consistency, with composite reliability coefficients ranging from .74 to .85. Table 2 displays item means, standard deviations, standardized factor loadings, and residuals for this solution, as well as factor correlations and internal consistency estimates. In addition to the composite reliability coefficient, interitem correlations and minimum corrected item-total correlations were used to assess internal reliability. All of the items included in the final CFA solution met the aforementioned criteria outlined by Kidder and Judd (1986).

In addition, a hierarchical model was tested in which the four first-order latent factors were represented by one higher order latent factor. The fit of the hierarchical measurement model was similar to that of the first-order model, S-Bχ^2 (86) = 147.50, $p < .001$, RCFI = .96, RNNFI = .95, SRMR = .06, RRMSEA = .05, and demonstrated good internal reliability ($\rho = .92$). The implications of this finding will be discussed later. A one-factor model was also tested, and this produced a very poor fit to the data: S-Bχ^2 (90) = 461.27, $p < .001$, RCFI = .76, RNNFI = .71, SRMR = .92, RRMSEA = .11, indicating that a controlling interpersonal style is a multidimensional construct represented by a number of separate, but related, controlling coaching strategies.

Invariance Testing

A sequential model testing approach was employed via multisample CFA to examine whether the CCBS displayed invariance across gender and sport type (team/individual). In relation to gender, a baseline model was established and then two

Table 2 Item Means, Standard Deviations, Factor Loadings, Residuals, and Skewness and Kurtosis Values Following Confirmatory Factor Analyses (Study 3)

CCBS Subscale and Item	*M*	*SD*	Loading	Residual	Skewness	Kurtosis
Controlling Use of Rewards						
My coach tries to motivate me by promising to reward me if I do well	2.46	1.63	.59	.81	1.08	0.36
My coach only rewards/praises me to make me train harder	3.02	1.67	.48	.88	0.60	–0.44
My coach only uses rewards/praise so that I stay focused on tasks during training	2.43	1.47	.84	.55	0.88	–0.03
My coach only uses rewards/praise so that I complete all the tasks he/she sets in training	2.42	1.43	.80	.60	0.89	0.09
Negative Conditional Regard						
My coach is less friendly with me if I don't make the effort to see things his/her way	3.17	1.90	.64	.77	0.49	–0.95
My coach is less supportive of me when I am not training and competing well	2.68	1.71	.77	.64	0.86	–0.19
My coach pays me less attention if I have displeased him/her	2.76	1.77	.87	.49	0.81	–0.41
My coach is less accepting of me if I have disappointed him/her	2.57	1.59	.84	.54	0.96	0.18
Intimidation						
My coach shouts at me in front of others to make me do certain things	2.23	1.71	.71	.70	1.40	0.99
My coach *threatens to punish me* to keep me in line during training	2.05	1.44	.49	.87	1.36	0.93
My coach intimidates me into doing the things that he/she wants me to do	1.90	1.35	.66	.75	1.51	1.42
My coach embarrasses me in front of others if I do not do the things he/she wants me to do	2.12	1.53	.83	.55	1.39	1.12
Excessive Personal Control						
My coach expects my whole life to center on my sport participation	2.48	1.65	.74	.67	1.05	0.20
My coach tries to control what I do during my free time	1.95	1.38	.77	.64	1.50	1.51
My coach tries to interfere in aspects of my life outside of my sport	1.98	1.36	.81	.59	1.45	1.35

Factor Correlations and Internal Consistency	1	2	3	4
1. Controlling Use of Rewards	.74			
2. Negative Conditional Regard	.55	.85		
3. Intimidation	.58	.67	.76	
4. Excessive Personal Control	.39	.60	.59	.79

Note. All factor loadings are statistically significant ($p < .05$). Words in italics represent new items / rephrased items from Study 2. Composite reliability coefficients are presented on the diagonal of the factor correlation matrix.

increasingly constrained models were specified to examine the equality of measurement (i.e., factor loadings) and structural parameters (i.e., factor covariances) across male and female samples (see Byrne, 2006). The procedure was then repeated to test for invariance across athletes involved in team and individual sports. The decision was made not to test for the equality of the factor variances, as Byrne suggests that these parameters are typically of little interest: "from a construct-validity perspective, we test only for the invariance of the factor covariances" (Byrne, 2006, p. 242). The relative goodness of fit between increasingly constrained models was analyzed via the S-Bχ^2 difference test (Satorra & Bentler, 2001) using the "sbdiff" software (Crawford, 2007). However, because the χ^2 statistic is influenced by sample size, the recommendations of Cheung and Rensvold (2002) were also adopted and a change in CFI of ≤.01 was considered indicative of model invariance.

Table 3 displays the goodness-of-fit indices for all multigroup models tested during the invariance analysis. Although the change in S-Bχ^2 was significant when the factor covariances were also constrained to be equal across male and female samples, the change in CFI was < .01, thus supporting the scale's factorial invariance across gender. A nonsignificant ΔS-Bχ^2 and a change in CFI of < .01 during both stages of the second analysis suggested that the factor loadings and factor covariances were also invariant across sport type. These analyses provide initial support for the factorial invariance of the CCBS measurement model. Multisample CFA procedures also revealed that the final CCBS model was invariant across the two data collection methods, suggesting that athletes responded in a similar fashion independent of whether they completed the questionnaire supervised or unsupervised (see Table 3).

Correlation Analysis: Controlling and Autonomy-Supportive Coach Behaviors

Athletes' perceptions of their coaches' autonomy-supportive behaviors (ρ = .89, *M* = 5.28, *SD* = 1.18) were correlated with the four CCBS subscales and an overall score of controlling behavior. The results revealed small-to-moderate negative correlations (controlling use of rewards *r* = –.18, negative conditional regard *r* = –.50, intimidation *r* = –.38, excessive personal control *r* = –.36, overall CCBS score *r* = –.46).

Study 4

The purpose of Study 4 was to use another independent sample to cross-validate the four-factor model supported in Study 3 via CFA.

Method

Participants

The sample (*N* = 189) comprised 50 males and 139 females aged between 12 and 17 years old (*M* = 14.64; *SD* = 1.74). The athletes were involved in both individual (*n* = 117) and team sports (*n* = 72) similar to the sports sampled in the previous

Table 3 Fit Indices for Invariance Analysis (Study 3)

Model	S-Bχ^2	*df*	*p*	RCFI	RNNFI	SRMR	RRMSEA	ΔS-Bχ^2	Δ*df*	*p*	ΔRCFI
Gender											
1. Unconstrained	248.25	168	.000	.942	.927	.078	.056				
2. Constrained factor loadings	257.94	179	.000	.943	.933	.082	.055	8.14	11	.701	.001
3. Constrained factor covariances	273.66	185	.000	.936	.927	.099	.058	15.15	6	.019	.007
Sport type											
1. Unconstrained	248.46	168	.000	.941	.926	.073	.056				
2. Constrained factor loadings	259.03	179	.000	.941	.931	.078	.055	9.12	11	.611	.000
3. Constrained factor covariances	269.61	185	.000	.938	.929	.091	.055	10.79	6	.095	.003
Data collection method											
1. Unconstrained	240.49	168	.000	.948	.935	.070	.054				
2. Constrained factor loadings	258.97	179	.000	.943	.933	.081	.054	18.95	11	.062	.005
3. Constrained factor covariances	269.37	185	.000	.940	.931	.097	.055	10.35	6	.111	.003

Note. S-Bχ^2 = Satorra–Bentler scaled chi-square statistic, RCFI = robust comparative fit index, RNNFI = robust non-normed fit index, SRMR = standardized root mean residual, RRMSEA = robust root mean square error of approximation. ΔS-Bχ^2 = Satorra–Bentler scaled chi-square difference, Δdf = difference in degrees of freedom, ΔRCFI = change in RCFI, when the fit of the more constrained model is compared with that of the previous less constrained model (Cheung & Rensvold, 2002).

studies. The athletes were competing at club (n = 41), county (n = 73), regional (n = 25), national (n = 38), or international (n = 12) level at the time of the study. Competitive experience ranged from 1 to 11 years (M = 4.57; SD = 2.14). The athletes had spent between 1 month and 10 years (M = 2.22 years; SD = 2.00) working with their current coach.

Measures and Procedure

The CCBS, as designed in Study 3, was administered. The way in which the participants were recruited and the data collection procedure remained the same as those outlined in the previous studies. Athletes completed the questionnaire supervised (71.9%) or were reached by mail (28.1%).

Results and Discussion

The 15-item four-factor solution was analyzed via CFA using EQS 6.1 (Bentler & Wu, 2002). The model displayed an excellent fit to the data: S-Bχ^2 (84) = 120.94, $p < .05$, RCFI = .96, RNNFI = .95, SRMR = .06, and RRMSEA = .05, confirming the validity of the factorial model. All four subscales demonstrated good internal consistency, with composite reliability coefficients ranging from .74 to .84. Table 4 displays item means, standard deviations, standardized factor loadings, and residuals for this solution, as well as factor correlations and internal consistency estimates. The hierarchical measurement model had a fit that was equivalent to that of the first-order model: S-Bχ^2 (86) = 122.10, $p < .05$, RCFI = .96, RNNFI = .95, SRMR = .06, RRMSEA = .05, and demonstrated good internal reliability (ρ = .93). These findings provide further support for the factor structure of the CCBS.

General Discussion

The purpose of the present research was to develop and psychometrically evaluate a questionnaire measure designed to assess sports coaches' controlling interpersonal style from the perspective of SDT. A systematic series of studies provided substantial support for the validity and reliability of the scores derived from the new measure. The questionnaire taps four separate controlling motivational strategies salient in the context of sport: the controlling use of rewards, negative conditional regard, intimidation, and excessive personal control. The four dimensions of controlling behavior are aligned well with the SDT literature and the results of qualitative studies conducted in the sport context (D'Arripe-Longueville et al., 1998; Fraser-Thomas & Côté, 2009; Scanlan et al., 1991). Collectively, the findings from the present research suggest that the CCBS has the potential to be at the heart of research investigating interpersonal control in the coaching context, currently an understudied but theoretically important component of SDT.

We believe that all four of the identified controlling strategies involve judging and devaluing athletes by treating them not as individuals with their own thoughts and feelings, but as objects that should be controlled to obtain certain outcomes such as winning. It is not surprising, therefore, that the judging and devaluing aspect of coaches' controlling behavior did not demonstrate sufficient discriminant

Table 4 Item Means, Standard Deviations, Factor Loadings, Residuals, and Skewness and Kurtosis Values Following Confirmatory Factor Analyses (Study 4)

CCBS Subscale and Item	*M*	*SD*	Loading	Residual	Skewness	Kurtosis
Controlling Use of Rewards						
My coach tries to motivate me by promising to reward me if I do well	2.88	1.68	.41	.91	0.75	–0.34
My coach only rewards/praises me to make me train harder	2.61	1.61	.76	.65	0.89	–0.05
My coach only uses rewards/praise so that I stay focused on tasks during training	3.37	1.71	.49	.87	0.43	–0.63
My coach only uses rewards/praise so that I complete all the tasks he/she sets in training	2.47	1.60	.89	.46	1.00	0.05
Negative Conditional Regard						
My coach is less friendly with me if I don't make the effort to see things his/her way	3.35	1.70	.61	.79	0.44	–0.74
My coach is less supportive of me when I am not training and competing well	3.22	1.66	.65	.76	0.40	–0.94
My coach pays me less attention if I have displeased him/her	3.18	1.70	.82	.57	0.50	–0.71
My coach is less accepting of me if I have disappointed him/her	2.78	1.69	.89	.46	0.80	–0.37
Intimidation						
My coach shouts at me in front of others to make me do certain things	2.55	1.62	.62	.79	1.01	0.19
My coach threatens to punish me to keep me in line during training	1.89	1.41	.72	.70	1.83	2.90
My coach intimidates me into doing the things that he/she wants me to do	2.28	1.59	.71	.70	1.27	0.93
My coach embarrasses me in front of others if I do not do the things he/she wants me to do	2.20	1.74	.82	.57	1.36	0.60
Excessive Personal Control						
My coach expects my whole life to center on my sport participation	2.74	1.76	.83	.57	0.84	–0.33
My coach tries to control what I do during my free time	2.22	1.52	.77	.64	1.25	0.85
My coach tries to interfere in aspects of my life outside of my sport	2.15	1.69	.87	.50	1.48	1.08

Factor Correlations and Internal Consistency	1	2	3	4
1. Controlling Use of Rewards	.74			
2. Negative Conditional Regard	.61	.84		
3. Intimidation	.70	.78	.81	
4. Excessive Personal Control	.49	.66	.67	.84

Note. All factor loadings are statistically significant ($p < .05$). Composite reliability coefficients are presented on the diagonal of the factor correlation matrix.

validity in the five-factor CCBS model (in the sense that it was highly correlated with the other factors). It is likely that the judging and devaluing subscale captured aspects of controlling behavior that were already implicit in the other subscales. For example, an athlete who finds his or her coach to be "less supportive when they are not training and competing well" (an item from the conditional regard scale) is also likely to perceive his/her coach to be "very judgmental if they are not competing well" (an item from the judging and devaluing subscale). Thus, the judging and devaluing subscale was removed from the questionnaire.[2]

The resultant four-factor model displayed an excellent fit to the data, and further analysis supported the internal consistency of the four subscales. Study 3 also provided initial support for the factorial invariance of the CCBS by suggesting that the factor loadings and factor covariances remained unchanged across both gender and sport type (team/individual). Future work should continue to test the validity of the CCBS by assessing whether its factorial structure is also invariant across age and competitive experience levels. Further research is also needed to test the temporal stability of the CCBS.

A hierarchical model was also tested in which the four first-order factors were represented by one higher order factor. The fit of the hierarchical measurement model was similar to that of the first-order model in both Studies 3 and 4. Marsh (1987) suggested that if the fit of the hierarchical model is comparable to the fit of the first-order model, the former should be preferred because it is more parsimonious. Such a model would be useful for researchers who are interested in an overall measure of a controlling environment (for example, when such a measure is used in complex structural equation modeling). However, if researchers are interested in examining whether specific aspects of the controlling interpersonal context predict specific outcomes, we suggest using the four-factor model to examine the impact of each facet of controlling coach behavior separately. Such research could be used to examine the utility of a differentiated conception of controlling behavior by ascertaining whether the separate behaviors have different effects on psychological, behavioral, and social outcomes.

The relatively low item mean scores obtained across Studies 2, 3, and 4 suggest that the majority of athletes participating in this research did not perceive their coaches to be overly controlling. However, frequency analyses revealed that athletes employed the entire response range for all items across all three studies. One potential reason for the relatively low item mean values could stem from the difficulties that arise when one tries to access athletes who have controlling coaches. Controlling coaches are likely to be very protective not only of their athletes, but also of their own coaching philosophy and the training environments they create. Ethically, coach consent had to be obtained during this research, thus controlling coaches had the opportunity to opt their athletes out of the studies. Nonetheless, it is important to note that the low item mean scores should not be used to draw inferences with regard to the factorial structure of the questionnaire, for which assessment should primarily focus on the fit indices.

As we expected, coaches' provision of autonomy support was only moderately correlated with the CCBS. Thus, although athletes' perceptions of both autonomy-supportive and controlling coach behaviors are helpful in understanding the psychological experiences of young athletes, we believe that when ill-being and other maladaptive outcomes are the focus of an investigation, controlling coaching

strategies will predict a larger amount of variance than autonomy-supportive strategies. This is because controlling strategies have the capacity to thwart athletes' feelings of autonomy, competence, and relatedness and, in turn, contribute to the development of controlled motivation and ill-being (Deci & Ryan, 2000).

For example, coaches who use rewards and praise to secure athlete compliance can foster external perceptions of control and undermine athletes' feelings of autonomy (Amorose & Horn, 2000). Further, low perceived competence can ensue when rewards and praise are used inappropriately and given noncontingently on performance (Hollembeak & Amorose, 2005). Under such circumstances, these extrinsic incentives may be perceived as an insincere and contrived attempt to control behavior (Henderlong & Lepper, 2002) and could, therefore, also have a negative impact upon the need for relatedness.

Similarly, the use of excessive personal control imposes an external pressure upon athletes to prioritize their sport involvement over other aspects of their lives. Feelings of autonomy will be undermined if such commitment is elicited and maintained as a result of external monitoring and pressure, as opposed to free will (Deci & Ryan, 2000). Findings from the parental literature also suggest that coaches who attempt to control and restrict their athletes' behavior outside of their sport participation may also undermine competence and relatedness needs (e.g., Kerr & Stattin, 2000). In the coaching context, the use of overly intrusive behaviors may be perceived to convey a lack of trust in the athletes and their ability to self-regulate their own behavior to optimize their athletic performance. This may lead to feelings of resentment toward the coach, especially if athletes are prevented from engaging in desired activities (such as spending time with friends).

The parental literature indicates that motivational strategies that attempt to control athlete behavior by overtly manipulating or exploiting the coach–athlete relationship (i.e., intimidation and negative conditional regard) will also damage feelings of relatedness (e.g., Assor et al., 2004). Athletes who are subjected to behaviors designed to intimidate (i.e., yelled at and embarrassed) or repeatedly exposed to negative conditional regard (i.e., ignored when they are not performing well) may be left feeling humiliated and questioning their own self-worth (e.g., Barber, 2001). Therefore, as well as thwarting relatedness needs, the use of intimidation and conditional regard can also undermine athletes' perceptions of their own competence. These manipulative behaviors leave athletes with little choice but to relinquish their autonomy and comply with advocated behaviors to maintain a satisfactory relationship with their coach and avoid conflict.

Therefore the consequence of not emitting requested behaviors in controlling environments could become so high that athletes can no longer choose to behave otherwise (Mageau & Vallerand, 2003). This undermines the athletes' psychological needs and leads to controlled motivation and a variety of negative affective, cognitive, and behavioral consequences (Deci & Ryan, 2000). However, the CCBS is yet to be fully empirically tested with other SDT variables and future research efforts—in particular, longitudinal studies—are needed to understand exactly how controlling interpersonal behaviors, as assessed by the CCBS, are implicated in athletes' motivation and well-being. For example, studies could examine the role of such behaviors in predicting symptoms of overtraining, burnout, and disordered eating.

In summary, the purpose of the current research was to evaluate the construct validity and reliability of scores derived from the CCBS, a self-report measure

designed specifically to assess athletes' perceptions of controlling coach behaviors from the perspective of SDT. Overall the findings have provided substantial support for the new questionnaire measure. The unique contribution of this research is the creation of a multidimensional instrument designed to measure an understudied aspect of SDT in the sport context, a domain in which issues of motivation and psychological well-being are important considerations. We hope that the CCBS will facilitate research into the darker side of coaching and help coaches self-reflect on the motivational strategies they employ.

Notes

1. A covariance matrix was factor analyzed. However, at the request of an anonymous reviewer, the Likert-scaled items were treated as ordinal and the final CFA solutions from Studies 3 and 4 were also analyzed in EQS using polychoric correlations. The fit of the polychoric-based models was very slightly improved using the ordinal variable methodology (but did not alter any substantive conclusions). Factor loadings were very similar between the models that treated the scales as ordinal versus interval (mean difference: Study 3 = 0.05; Study 4 = 0.03). Therefore, in line with the majority of published psychometric papers, the Likert-scaled items were treated as interval throughout the article.

2. As suggested by a second anonymous reviewer, it may be useful for future research to reevaluate the decision made in the current paper to remove the judging and devaluing factor from the CCBS due to high interfactor correlations (the items for this factor can be found in Table 1). At the request of the reviewer, a second hierarchical model was tested that also included the judging and devaluing factor. This five first-order factor hierarchical model also produced a good fit to the data, S-Bχ^2 (148) = 244.76, $p < .001$, RCFI = .95, RNNFI = .94, SRMR = .05, RRMSEA = .05), indicating the need for future research on this issue.

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